3. The electromagnetic-wave generation device according to claim **1**, wherein the first semiconductor has a length which is equivalent to or less than a mean free path extending along the direction in which the carrier travels.

4. The electromagnetic-wave generation device according to claim **1**, wherein the first semiconductor is intrinsic or has an electron density or a hole density which is low enough to allow electric-field application.

5. The electromagnetic-wave generation device according to claim **1**, wherein the emitter section includes a conductive semiconductor that is placed between the first electrode and the second semiconductor, and in contact with the second semiconductor, and that has a conductivity type equivalent to a conductivity type of the carrier.

6. The electromagnetic-wave generation device according to claim **1**, wherein the collector section includes a semiconductor that has an energy gap larger than photon energy of the light and that has a conductivity type equivalent to a conductivity type of the carrier.

7. The electromagnetic-wave generation device according to claim **1**, wherein the collector section, the carrier-travel section, and the emitter section are stacked on one another with the carrier-travel section being between the emitter section and the collector section.

8. The electromagnetic-wave generation device according to claim **1**, wherein the first and second electrodes are composed of the same type of semiconductor material.

9. A time-domain spectroscopic system comprising:
the electromagnetic-wave generation device according to claim **1**;
an electromagnetic-wave detection device configured to detect an electromagnetic wave generated from the electromagnetic-wave generation device; and
a delay system configured to adjust a delay time between time when the electromagnetic wave is generated from the electromagnetic-wave generation device and time when the electromagnetic wave is detected with the electromagnetic-wave detection device,
wherein a time waveform of the electromagnetic wave is acquired by changing the delay time with the delay system.

10. A time-domain spectroscopic system comprising:
the electromagnetic-wave generation device according to claim **2**;
an electromagnetic-wave detection device configured to detect an electromagnetic wave generated from the electromagnetic-wave generation device; and
a delay system configured to adjust a delay time between time when the electromagnetic wave is generated from the electromagnetic-wave generation device and time when the electromagnetic wave is detected with the electromagnetic-wave detection device,
wherein a time waveform of the electromagnetic wave is acquired by changing the delay time with the delay system.

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